

REMARKS

Claims 49-56, 58, 59, and 61-67 are pending in the application; claims 57 and 60 have been cancelled; and claims 50, 51, 53, 54, 56 and 59 have been amended. Reconsideration of this application in light of the above amendments and the following remarks is requested. Applicants appreciate the Examiner's indication of allowance of claims 61-63 and 66, and the indication of allowable subject matter in claims 50-51, 53-54, 56-57, and 59-60.

I. Objections to the Claims

Claims 50-51, 53-54, 56-57, 59 and 60 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form. Claims 50, 51, 53, 54, 56, and 59 have been amended to include all the limitations of the respective base claims. Accordingly, withdrawal of the objection to claims 50-51, 53-54, 56, and 59 is requested.

II. Rejections Under 35 U.S.C. §102

Claims 49, 52, 64 and 67 were rejected under 35 U.S.C. §102(b) as being anticipated by US Patent No. 6,333,215 to Matsuda, et al. (hereinafter referred to as "Matsuda").

Claim 49

Claim 49 recites the following:

49. An integrated method comprising:
providing a low dielectric material;
applying a first treatment altering a first property of the low dielectric material, the first treatment being a treatment other than a thermal treatment; and
applying a second treatment altering a second property of the treated low dielectric material and producing a lower dielectric material with better mechanical stability.

The PTO provides in MPEP § 2131 that

"[t]o anticipate a claim, the reference must teach every element of the claim...."

Therefore, with respect to claim 49, to sustain this rejection the Matsuda patent must contain all of the above claimed elements of the claim. However, contrary to the examiner's

position that all elements are disclosed in the Matsuda reference, Matsuda does not disclose “applying a first treatment altering a first property of the low dielectric material, the first treatment being a treatment other than a thermal treatment,” or “applying a second treatment altering a second property of the treated low dielectric material and producing a lower dielectric material with better mechanical stability.”

With regard to the claim 49 limitation of “applying a first treatment altering a first property of the low dielectric material, the first treatment being a treatment other than a thermal treatment,” the Examiner cites the following passage of Matsuda as allegedly disclosing such a method step:

The preliminary treatment, i.e. a first treatment is performed by *subjecting a solid material to a thermal treatment or a chemical treatment*. This chemical treatment includes an oxidizing treatment, a reducing treatment and an acid treatment. The conditions for these thermal treatment and chemical treatment may be optionally selected *depending on the kinds of the solid material* and on the properties desired.
Matsuda, Column 3, Lines 11-17 (*emphasis added*).

Thus, Matsuda only generally discloses that a “solid material” may be subjected to a first treatment comprising a thermal or chemical treatment. Matsuda does not provide any disclosure or suggestion for “applying a first treatment” of a “low dielectric material” wherein the first treatment is “other than a thermal treatment.” Each and every instance described by Matsuda where a solid material comprises an insulating or dielectric material, the first treatment is explicitly described as comprising a thermal treatment. For example, Matsuda recites the following:

First of all, a first specific embodiment of a first example according to this example will be explained with reference to FIGS. 1A to 1C and 2. This first specific embodiment is featured in that a fluorine-containing glass film of low dielectric constant which has been subjected in advance to a high temperature thermal treatment so as to provide it with desired characteristics is formed on the surface of a substrate for a semiconductor device.
Matsuda, Column 5, Line 65-Column 6, Line 5 (*emphasis added*).

Therefore, with a view to stabilize the film, the fluorine-containing glass film 12 was heat-treated at a high temperature. Specifically, the fluorine-containing glass film 12 was heat-treated for one hour in a reduced pressure nitrogen atmosphere of 100 mTorr and at a temperature of 1,100° C. As a result of this heat treatment, unstable fluorine was

partially desorbed from the fluorine-containing glass film 12, thus leaving fluorine at a concentration of 7.8 atomic % in the resultant fluorine-containing glass film 12.
Matsuda, Column 6, Line 34-42 (emphasis added).

Thus, Matsuda is clear that the glass film (element 12 cited by the Examiner as allegedly disclosing a dielectric material) is subjected to a first treatment that is a thermal treatment. Various other treatment sequences are described by Matsuda. In each instance, Matsuda describes a first treatment of dielectric or insulating materials as comprising a thermal treatment (See, for example, Matsuda Column 7, Lines 4-8, and Lines 22-26; Column 8, Lines 35-43, Lines 60-63; and Column 9, Lines 9-16, Lines 30-37). Thus, it is clear that the treatment mechanisms for dielectric or insulating materials described by Matsuda include a first thermal treatment. Matsuda is wholly silent with regard to “applying a first treatment altering a first property of the low dielectric material, the first treatment being a treatment other than a thermal treatment,” and thus fails to teach each and every limitation of claim 49. For at least his reason, Matsuda is insufficient to anticipate claim 49, and withdrawal of the rejection of claim 49 is respectfully requested.

With regard to the claim 49 limitation of “applying a second treatment altering a second property of the treated low dielectric material and producing a lower dielectric material with better mechanical stability,” the Examiner cites the following passage of Matsuda as allegedly disclosing such a method step:

It is also possible according to this invention to perform a second treatment consisting of a thermal treatment and/or a chemical treatment on the substrate for a semiconductor device on which a thin film has been already formed. In this case, the treatment effect of the first treatment should be equivalent to or higher than the effect that can be obtained by the second treatment.

Matsuda, Column 3, Lines 42-48.

Thus, Matsuda only discloses that an “effect” of a first treatment is to be equivalent or greater than the effect obtained by the second treatment. No description or suggestion is provided by Matsuda that the second treatment alters a “second property” that is distinguished from a “first property” altered by a first treatment. For at least his reason, Matsuda is insufficient to anticipate claim 49, and withdrawal of the rejection of claim 49 is respectfully requested.

Independent claims 52, 64 and 67 recite similar features as claim 49 and were rejected for similar rationale as claim 49. Therefore, the same distinctions between Matsuda and the claimed invention in claim 49 apply for claims 52, 64, and 67. For the reasons described above, Matsuda does not anticipate the claims, and the rejection of claims 49, 52, 64, and 67 under 35 U.S.C. §102 should be withdrawn.

III. Rejections Under 35 U.S.C. §103

Claim 58

Claim 58 recites the following:

58. An integrated method comprising:
providing a low dielectric material;
applying a first treatment altering a first property of the low dielectric material, the first treatment treating the low dielectric material with ultraviolet radiation; and
applying a second treatment altering a second property of the treated low dielectric material and producing a lower dielectric material with better mechanical stability.

Claim 58 was rejected under 35 U.S.C. §103(a) as being unpatentable over Matsuda in view of US Patent Publication No. US 2005/0124168 to Nagahara et al. (hereinafter referred to as Nagahara).

Applicants traverse this rejection on the grounds that these references are defective in establishing a prima facie case of obviousness with respect to claim 58.

As the PTO recognizes in MPEP § 2142:

... The examiner bears the initial burden of factually supporting any prima facie conclusion of obviousness. If the examiner does not produce a prima facie case, the applicant is under no obligation to submit evidence of nonobviousness...

It is submitted that, in the present case, the examiner has not factually supported a prima facie case of obviousness for the following, mutually exclusive, reasons.

1. Even When Combined, the References Do Not Teach the Claimed Subject Matter

The Matsuda and Nagahara references cannot be applied to reject claim 58 under 35 U.S.C. § 103 which provides that:

A patent may not be obtained ... if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains ... (Emphasis added)

Thus, when evaluating a claim for determining obviousness, all limitations of the claim must be evaluated. However, since neither Matsuda or Nagahara teaches “applying a second treatment altering a second property of the treated low dielectric material and producing a lower dielectric material with better mechanical stability” as is claimed in claim 58, it is impossible to render the subject matter of claim 58 as a whole obvious, and the explicit terms of the statute cannot be met.

As discussed above with regard to the rejection of claim 49, Matsuda provides no description or suggestion of a second treatment that alters a “second property” that is distinguished from a “first property” altered by a first treatment. For at least this reason, Matsuda and Nagahara are insufficient to obviate claim 58.

Thus, for this mutually exclusive reason, the examiner’s burden of factually supporting a *prima facie* case of obviousness has clearly not been met, and the rejection under 35 U.S.C. §103 should be withdrawn.

2. The Combination of References is Improper

§ 2142 of the MPEP also provides:

...the examiner must step backward in time and into the shoes worn by the hypothetical ‘person of ordinary skill in the art’ when the invention was unknown and just before it was made.....The examiner must put aside knowledge of the applicant’s disclosure, refrain from using hindsight, and consider the subject matter claimed ‘as a whole’.

Here, neither Matsuda or Nagahara teaches, or even suggests, the desirability of the combination since neither teaches “applying a second treatment altering a second property of the treated low dielectric material and producing a lower dielectric material with better mechanical stability” as specified above and as claimed in claim 58.

Thus, it is clear that neither patent provides any incentive or motivation supporting the desirability of the combination. Therefore, there is simply no basis in the art for combining the references to support a 35 U.S.C. § 103 rejection.

In this context, the MPEP further provides at § 2143.01:

The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination.

In the above context, the courts have repeatedly held that obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination.

In the present case it is clear that the examiner’s combination arises solely from hindsight based on the invention without any showing, suggestion, incentive or motivation in either reference for the combination as applied to claim 58. Therefore, for this mutually exclusive reason, the examiner’s burden of factually supporting a *prima facie* case of obviousness has clearly not been met, and the rejection under 35 U.S.C. §103 should be withdrawn.

Claim 55

Claim 55 was rejected under 35 U.S.C. §103(a) as being unpatentable over Matsuda in view of US Patent No. 6,861,339 to Chen, et al. (hereinafter referred to as Chen).

Applicants traverse this rejection on the grounds that these references are defective in establishing a *prima facie* case of obviousness with respect to claim 55.

1. Even When Combined, the References Do Not Teach the Claimed Subject Matter

Claim 55 recites the following:

55. An integrated method comprising:
providing a low dielectric material;
applying a first treatment altering a first property of the low dielectric material, the first treatment treating the low dielectric material with hydrogen-based plasma; and
applying a second treatment altering a second property of the treated low dielectric material and producing a lower dielectric material with better mechanical stability.

Since neither Matsuda or Chen teaches “applying a second treatment altering a second property of the treated low dielectric material and producing a lower dielectric material with better mechanical stability” as is claimed in claim 55, it is impossible to render the subject matter of claim 55 as a whole obvious, and the explicit terms of the statute cannot be met.

As discussed above with regard to the rejection of claim 49, Matsuda provides no description or suggestion of a second treatment that alters a “second property” that is distinguished from a “first property” altered by a first treatment. Chen provides for none of the deficiencies of Matsuda. For at least this reason, Matsuda and Chen are insufficient to obviate claim 55.

Thus, for this mutually exclusive reason, the examiner’s burden of factually supporting a *prima facie* case of obviousness has clearly not been met, and the rejection under 35 U.S.C. §103 should be withdrawn.

2. The Combination of References is Improper

Here, neither Matsuda or Chen teaches, or even suggests, the desirability of the combination since neither teaches “applying a second treatment altering a second property of the treated low dielectric material and producing a lower dielectric material with better mechanical stability” as specified above and as claimed in claim 55.

Thus, it is clear that neither patent provides any incentive or motivation supporting the desirability of the combination. Therefore, there is simply no basis in the art for combining the references to support a 35 U.S.C. § 103 rejection.

In the present case it is clear that the examiner's combination arises solely from hindsight based on the invention without any showing, suggestion, incentive or motivation in either reference for the combination as applied to claim 55. Therefore, for this mutually exclusive reason, the examiner's burden of factually supporting a *prima facie* case of obviousness has clearly not been met, and the rejection under 35 U.S.C. §103 should be withdrawn.

Claim 65

Claim 65 was rejected under 35 U.S.C. §103(a) as being unpatentable over Matsuda in view of US Patent No. 6,051,443 to Ghio et al. (hereinafter referred to as Ghio).

Applicants traverse this rejection on the grounds that these references are defective in establishing a *prima facie* case of obviousness with respect to claim 55.

1. Even When Combined, the References Do Not Teach the Claimed Subject Matter

Claim 65 recites the following:

65. An integrated method comprising:
providing a low dielectric material;
applying a first treatment altering a first property of the low dielectric material;
applying a second treatment altering a second property of the treated low dielectric material and producing a lower dielectric material with better mechanical stability; and
wherein one of the first and second treatment comprises treating the low dielectric material with ultraviolet radiation.

Since neither Matsuda or Ghio teaches “applying a second treatment altering a second property of the treated low dielectric material and producing a lower dielectric material with better mechanical stability” as is claimed in claim 65, it is impossible to render the subject matter of claim 65 as a whole obvious, and the explicit terms of the statute cannot be met.

As discussed above with regard to the rejection of claim 49, Matsuda provides no description or suggestion of a second treatment that alters a “second property” that is distinguished from a “first property” altered by a first treatment. Ghio provides for none of the deficiencies of Matsuda. For at least his reason, Matsuda and Ghio are insufficient to obviate claim 65.

Thus, for this mutually exclusive reason, the examiner's burden of factually supporting a *prima facie* case of obviousness has clearly not been met, and the rejection under 35 U.S.C. §103 should be withdrawn.

2. The Combination of References is Improper

Here, neither Matsuda or Ghio teaches, or even suggests, the desirability of the combination since neither teaches "applying a second treatment altering a second property of the treated low dielectric material and producing a lower dielectric material with better mechanical stability" as specified above and as claimed in claim 65.

Thus, it is clear that neither patent provides any incentive or motivation supporting the desirability of the combination. Therefore, there is simply no basis in the art for combining the references to support a 35 U.S.C. § 103 rejection.

In the present case it is clear that the examiner's combination arises solely from hindsight based on the invention without any showing, suggestion, incentive or motivation in either reference for the combination as applied to claim 65. Therefore, for this mutually exclusive reason, the examiner's burden of factually supporting a *prima facie* case of obviousness has clearly not been met, and the rejection under 35 U.S.C. §103 should be withdrawn.

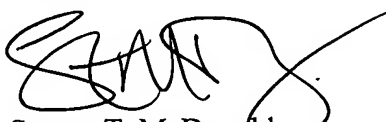
IV. Conclusion

It is clear from all of the foregoing that independent claims 49, 52, 55, 58, 61, 64-67 are in condition for allowance. Dependent claims 50-51, 53-54, 56-57, 59-60, 62, and 63 depend from and further limit the independent claims and therefore are allowable as well.

The examiner is invited to call the undersigned at the below-listed telephone number if in the opinion of the examiner such a telephone conference would expedite or aid the prosecution and examination of this application.

The Director is hereby authorized to charge any fees which may be required or credit any overpayment to Deposit Account Number 08-1394.

Respectfully submitted,



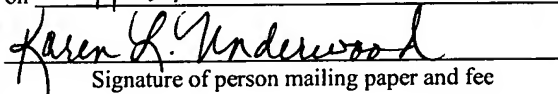
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